June 7, 2000

MEMORANDUM

SUBJECT: REVISION OF EXPOSURE ASSESSMENT FOR DDVP APPLIED TO WAREHOUSES AND FOOD PROCESSING PLANTS (PC Code 084001, Barcode D266572)

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Special Review and Reregistration Division (SRRD) has requested HED to revise an exposure assessment for application of dichlorvos (DDVP) to food processing establishments. A study was submitted by the registrant and reviewed by HED in December 1993 (1). At that time the reentry interval for these products was 6 hours. SRRD has informed HED that the reentry interval has been increased to 24 hours and requested that the exposure/risk assessment be revised to reflect this change.

The original review of the study indicated that the dermal component of exposure was negligible compared to the respiratory route for this scenario. Therefore no change to the dermal estimate is necessary. The original exposure table from this report is presented in Table 1. Respiratory exposure was estimated by calculating a first order decay equation of the form:

$$C_t = C_0 e^{-kt}$$

The equation for this scenario was:

$$C_t = 2.63\ mg/m^3 \times e^{-0.11t}$$

where t = time, in hours

This equation was then integrated over various time intervals and appropriate constants included to yield an estimate of the respiratory exposure for a given work

period. If the reentry period is extended to 24 hours and a worker is in the treated facility for 8 hours the exposure would be:

$$\text{Respiratory exposure (mg/kg/day)} = \int_{24}^{32} 2.63\, e^{-0.11t} \times 1.7\ m^3/hr \times 1/70\ kg$$

$$= \left[-2.63/0.11(e^{-0.11(32)} - e^{-0.11(24)})\right] \times 0.024\ m^3/hr\ kg$$

$$= -23.9 \times (0.030 - 0.071) \times 0.024$$

$$= 0.024\ mg/kg/day$$

Since repeated use of these products is allowed and persons might be exposed for more than one day a NOAEL of 0.1 mg/kg/day was selected. The resulting Margin of Exposure (MOE) is:

MOE = 0.1 mg/kg/day ÷ 0.024 mg/kg/day = 4.2

Table 1. Summary of Dermal and Respiratory Exposures of Workers in a Food Processing Plant after Treatment of the Facility with DDVP Applied as a Fog (taken from Reference 1).

	Exposure (mg/kg/day)		
	One Day After Treatment (6-14 hrs)	Two Days After Treatment (30-38 hrs)	Three Days After Treatment (54-62 hrs)
Dermal (Hands only)	2.7×10^{-4}	5.9×10^{-5}	2.9×10^{-5}
Respiratory	0.18	0.013	0.00088
Total	0.18	0.013	0.00091

REFERENCES

1) Memorandum from D. Jaquith (OREB) to B. Lowery (SRRD titled “Review of Exposure Monitoring Study for Use of DDVP in Food Processing Establishments”, dated December 6, 1993.

cc: Dichlorvos file (084001)
Correspondence file
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